

# Can echolocation calls of Cuban mormopid bats visualized through a heterodyne system?

Moreno C.R.

Sánchez L.

Macias S.

Mora E.C.

In this study, we evaluate the potential of the heterodyne system for the acoustic identification of bat species from Mormoopidae in Cuba. The heterodyne transformation of the echolocation calls of the three mormoopid species of *Pteronotus* (*P. macleayii*, *P. quadridens* and *P. parnellii*) was initially analyzed by setting the frequency of the heterodyne detector ( $f$  tuned) 5 kHz above and below the constant frequency value of the second harmonic, respectively. We then studied the feasibility for the identification of several *Pteronotus* species with single  $f$  tuned values. The heterodyne transformation of calls from the mormoopid *Mormoops blainvillii* and four Cuban phyllostomid bats was studied by selecting frequency values contained in the calls of each of the species under study. We showed that, by selecting the appropriate  $f$  tuned, the *Pteronotus* species could be accurately identified based on the spectral signatures of their heterodyned calls. Frequency modulated (FM) bats presented very similar heterodyne signatures and therefore could not be identified to species level. The study points to heterodyne detectors as appropriate to conduct acoustic surveys of mormoopids and other constant frequency (CF) and quasi CF bat species. © Copyright 2016 College of Arts and Sciences University of Puerto Rico, Mayagüez.

acoustic identification

bat detectors

heterodyne

Mormoopid

*Pteronotus*

acoustic survey

bat

detection method

echolocation

identification method

signal processing

Cuba

Mormoopidae

Mormoops blainvillii

Phyllostomidae

Pteronotus

Pteronotus macleayii

Pteronotus parnellii

Pteronotus quadridens